

REMARKS

Claims 12-51 have been withdrawn in response to the restriction dated June 4, 2007, leaving claims 1-11 pending in this application.

In the Final Office Action mailed on April 4, 2008, the Examiner rejected claims 1-11 under 35 U.S.C. § 101 as being directed to non-statutory subject matter, rejected claims 2-4 and 6-11 under 35 U.S.C. § 112 as being indefinite, and rejected claims 1 - 11 under 35 U.S.C. § 102(b) as being anticipated by *Borrel et al.* "Deformation of n-dimensional objects." Applicants respectfully traverse these rejections. By this Amendment, Applicants have amended claims 1, 2, 5, 6, and 11, and canceled claim 7 without prejudice or disclaimer of its subject matter. The amendments to independent claims 1 and 5 substantially incorporate the features recited in claim 7, which is now canceled. The originally-filed specification fully supports the amendments to claims 1, 2, 5, 6, and 11. Thus this Amendment does not introduce new matter.

Section 101 Rejection

Claims 1-11 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The rejection of claim 7 is moot by virtue of the cancellation of this claim without prejudice or disclaimer of its subject matter. In this rejection, the Final Office Action alleged that the claims "do not produce a useful, concrete, and tangible result," citing State Street Bank. Final Office Action, p. 4. Applicants respectfully disagree.

35 U.S.C. § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent: processes, machines, manufactures and compositions of matter. Claims 1-4 are directed toward a design shape generating

apparatus, which includes an input device, a transformation processing device, and an auxiliary shape adding device. The claimed design shape generating apparatus falls within at least the “machine” category and is therefore patentable statutory subject matter. The Final Office Action has inappropriately applied the State Street Bank test, which applies to process claims, to claims 1-4, which recite a machine. Even if the test is properly applied to claims 1-4, Applicants also submit that the design shape generating apparatus recited in claims 1-4 clearly produces a “useful, concrete, and tangible result,” e.g., a new design shape of an article. As a person of ordinary skill in the art can appreciate, once the new design shape of an article is generated, the new design shape can be used to build, process, or manufacture a physical article into the new design shape. Therefore, the new design shape of the article constitutes one “useful, concrete, and tangible result” produced by the claimed design shape generating apparatus of claims 1-4.

Claims 5-6 and 8-11, as amended, are directed toward a design shape generating method for generating a new design shape of an article. The claimed method belongs to the “process” category of statutory subject matter. The Examiner alleged that “[t]he claims appear to be directed to a CAD environment however as presented they appear to be merely an abstract idea as well as mere data manipulation.” Final Office Action, p. 4. Applicants respectfully disagree.

The method recited in claims 5-6 and 8-11 includes detailed steps for a process for performing shape transformation using, among other things, a transformation processing device and an input device. Even if the claimed method in claims 5-6 and 8-11 was an abstract idea, as alleged by the Final Office Action, which Applicants do not

concede, the abstract idea may have a practical application. “[A] claim reciting an algorithm or abstract idea can state statutory subject matter only if, as employed in the process, it is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter.” *In re Comiskey*, 499 F.3d 1365, 1376 (Fed. Cir. 2007).

The method claimed in claims 5-6 and 8-11 is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine. Specifically, the claimed method is “tied to a particular apparatus.” *Id.* at 1376 (citation omitted). For example, claim 5 recites “a transformation instruction input step of receiving, by an input device from the operator, a transformation instruction vector . . . , and a shape transformation processing step of performing, by a transformation processing device, a displacement process . . . ” (emphasis added). The claimed method also transforms a shape of an article to a “different state or thing,” which is a new design shape of the article. *Comiskey*, 499 F.3d at 1376 (citation omitted).

Furthermore, the method produces a useful, concrete, and tangible result, e.g., “a new design shape of an article.” As can be appreciated by a person of ordinary skill in the art, the “new design shape” of the article can be used to build, process, or manufacture a physical article in the new design shape. Therefore, the new design shape of the article produced by the claimed method constitutes “a useful, concrete, and tangible result.”

Based on above arguments, Applicants submit that the subject matter claimed in claims 1-6 and 8-11 is statutory subject matter, and the Section 101 rejection is

inappropriate. Applicants respectfully request reconsideration of the amended claims, and withdrawal of the Section 101 rejection of claims 1-6 and 8-11.

Section 112 Rejection

Claims 2-4 and 6-11 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The rejection of claim 7 is moot by virtue of the cancellation of this claim without prejudice or disclaimer of its subject matter. Regarding claims 2 and 6, the Final Office Action argued that, “[i]t is unclear what is meant by adding a shape” Final Office Action, p. 5. By this amendment, Applicants have amended claims 2 and 6 to clarify that “the transformation processing device . . . attaches the auxiliary shape to the new base shape by an auxiliary shape adding device at a predetermined position of the new base shape” (emphasis added) (claim 2), and that “the auxiliary shape is attached to the new base shape by an auxiliary shape adding device at a predetermined position of the new base shape” (emphasis added) (claim 6). The amendments to claims 2 and 6 are supported by the specification at, for example, p. 18, line 24 to p. 19, line 4. Applicants submit that claims 2 and 6, as amended, clearly point out and claim the subject matter of the invention.

The Final Office Action also rejected claim 11 for the reason that “[i]t is unclear what encompasses an allowable angle or how allowability is determined.” Applicants have amended claim 11 to recite “a predetermined angle.” Applicants maintain that claim 11, as amended, clearly points out and distinctly claims the subject matter of the invention.

Although the Examiner included claims 3-4 and 8-10 in the summary of the Section 112 rejection, no reason was given why claims 3-4 and 8-10 violate Section 112. Therefore, Applicants understand that the Examiner did not in fact reject these claims under Section 112.

Therefore, Applicants respectfully request withdrawal of the Section 112 rejection of claims 2-4, 6, and 8-11.

Section 102 Rejection

Claims 1-11 stand under 35 U.S.C. § 102(b) as being anticipated by *Borrel et al.* “Deformation of n-dimensional objects.” The Applicants respectfully traverse the rejection. Applicants note that the rejection of claim 7 is moot by virtue of the cancellation of this claim without prejudice or disclaimer of its subject matter.

Borrel et al. discloses a mapping “technique for computing space deformations that interpolate a set of user-defined constraints.” *Borrel et al.*, p. 351. The technique achieves deformation by a polynomial mapping from space \mathbf{R}^n to \mathbf{R}^n . It involves two steps of mapping. First, it maps points from the \mathbf{R}^n space into a higher-dimensional space, the \mathbf{R}^m space, using a polynomial function f of \mathbf{R}^n . Then it maps the points back from \mathbf{R}^m space to \mathbf{R}^n space with a linear projection. *Borrel et al.*, p. 351.

In order to establish anticipation under 35 U.S.C. § 102, the Final Office Action must show that each and every feature as set forth in the amended claim 1 is found, either expressly or inherently described, in *Borrel et al.* See MPEP § 2131. Although *Borrel et al.* discloses a shape transformation process, it does not disclose or suggest each and every feature of independent claims 1 and 5, incorporated by reference into the dependent claims. For example, claim 1, as amended, now recites a transformation

processing device configured to displace a node defining the shape of the shape elements and belonging only to the transformation region in accordance with the input transformation instruction vector depending on the location of the node with respect to a bending line or a plurality of bending lines.

In contrast, *Borrel et al.* fails to disclose a transformation processing device configured to displace a node as recited in amended claim 1. Applicants note that the Final Office Action merely generally pointed to various disclosures of Section 3.4.1 of *Borrel et al.*, but failed to specifically point out why and how the alleged disclosures relate to the claimed features. For example, claim 1 recites “when a node is located on a single bending line of an article . . . ,” but *Borrel et al.* merely discloses “e.g. 2D, 3D, and 4D shapes”. Final Office Action, p. 8. It is unclear how the “2D, 3D, and 4D shapes” are related to the recited features. For another example, amended claim 1 recites “the node is displaced . . . corresponding to a component of the input transformation vector,” but the Final Office Action referred to “merely shape deformation and transformation” of *Borrel et al.* However, despite the fact that *Borrel et al.* discloses a technique for “shape deformation and transformation,” there is no disclosure or suggestion in *Borrel et al.* how a node is displaced or the relationship between an input transformation vector and node displacement.

Applicants therefore submit that amended independent claim 1 is not anticipated by *Borrel et al.*, and should be allowed. Claims 2-4 depend from claim 1 and also are not anticipated by *Borrel et al.* at least for the reasons given above. Claim 5 also incorporates features similar to those discussed above with respect to claim 1. For at least the same reasons, claim 5 also is not anticipated by *Borrel et al.* Claims 6 and 8-


11 depend from independent claim 5 and are therefore also not anticipated by the reference. Applicants respectfully request withdrawal of the Section 102 rejection of claims 1-6 and 8-11.

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and allowance of all pending claims. Please grant any additional extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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